

FACT SHEET FOR NPDES PERMIT NO. WA0021105
City of Chehalis

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This fact sheet is a companion document to the draft National Pollutant Discharge Elimination System (NPDES) Permit No. WA-002110-5. The Department of Ecology (the Department) is proposing to issue this permit which will allow discharge of treated municipal wastewater to waters of the state of Washington.

This fact sheet explains the nature of the proposed discharge, the Department's decisions on limiting the pollutants in the wastewater, and the regulatory and technical basis for those decisions. Public involvement information is contained in Appendix A. Definitions are included in Appendix B.

GENERAL INFORMATION

Applicant: City of Chehalis, City of Napavine and Lewis County Sewer District No. 1
Post Office Box 871
Chehalis, WA 98532

Facility Name and Address: Chehalis Wastewater Treatment Plant
1191 NW Shoreline Drive
Chehalis, WA 98532

Type of Treatment: Trickling filter/Activated Sludge
Disinfection by Chlorination

Discharge Location: Chehalis River
@ River Mile 74.3

Latitude: 46° 39' 38" N.
Longitude: 122° 59' 02" W.

Water Body ID Number: WA-23-1020

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BACKGROUND INFORMATION

DESCRIPTION OF THE RECEIVING WATER

General Water Uses and Criteria Classes

Chehalis River is designated as a Class A (excellent) Freshwater receiving water in the vicinity of the outfall. Characteristic uses include the following:

Water supply (domestic, industrial, agricultural); stock watering; fish migration; fish and shellfish rearing, spawning and harvesting; wildlife habitat; primary contact recreation; sport fishing; boating and aesthetic enjoyment; commerce and navigation.

WAC 173-201A Section 030 (2) (c) (ii) (A) requires dissolved oxygen (DO) shall exceed 8.0 mg/l in Class A waters. Section 030 (9) Special Conditions: Chehalis River from Scammon Creek (River Mile (RM) 65.8) to Newaukum River (RM 75.2) - dissolved oxygen shall exceed 5.0 mg/l from June 1 to September 15. For the remainder of the year, the dissolved oxygen shall meet Class A criteria. See section below titled "Water Quality Study (Total Maximum Daily Load, TMDL)" for further explanation of the water quality in the Chehalis River.

The Chehalis River in the vicinity of Chehalis (see Appendix D for "Site Location Map") has historically been an area of concern. The slow moving characteristics of the river in this area and the existence of holes up to 30 feet deep create phenomena more typically associated with lakes and impoundments. Earlier water quality studies (1980-1982) of the Chehalis River in this area indicated mid-summer thermal stratification and depressed oxygen concentrations in late summer and early fall. Subsequent upgrades to the Chehalis treatment and collection system have been completed to help mitigate the depletion events.

A number of groups in the Chehalis River basin are engaged in water quality activities. Under a grant from the Department, the Lewis County Conservation District (CD) helped to organize the Chehalis River Council (CRC), a citizen's committee whose goal is the protection of aquatic resources in the Chehalis basin. The CRC developed the Chehalis River Basin Action Plan (1992) to address nonpoint source pollution control efforts. The Lewis County CD and the CRC have received separate grant funding to conduct further studies in the basin.

The U.S. Fish and Wildlife Service (USFWS) is implementing the Chehalis River Basin Fishery Resources Study and Restoration Act of 1990. The USFWS will annually be awarding grant funds for habitat improvement which should be a source of some funding for nonpoint source controls.

Also active in water quality issues in the Chehalis River basin is the Confederated Tribes of the Chehalis Reservation (Chehalis Tribe). The Chehalis Tribe has received grant money from USFWS for fishery improvement projects and is beginning a water quality monitoring program on the Chehalis River as a follow-up to the work done in this study.

Water Quality Study (Total Maximum Daily Load)

Beginning in 1991, the upper Chehalis River basin from the headwaters to Porter was studied by the Department to establish a Total Maximum Daily Load (TMDL) for pollutants of concern. Water quality data was collected from July to October 1991 and May to September 1992 for the river parameters of concern and to allocate the load among the dischargers.

When the water quality of the waterbody (such as the Chehalis River) is threatened, the Federal Clean Water

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Act requires states to set limits on the amount of pollutants that the waterbody receives from all sources. These limits are known as Total Maximum Daily Loads (TMDLs). TMDLs differ from commonly used technology or water quality based numeric limits for discharges because they are based on the total amounts of a pollutant a waterbody can receive from all sources and still meet state Water Quality Standards.

In July 1993, the Department introduced the watershed approach as a new way of protecting water quality. The watershed approach uses a geographic based five-year cycle for scheduling and coordinating the issuance of wastewater discharge permits and other source controls with water quality assessments. The Upper Chehalis Basin is now entering the fifth year of the watershed management cycle, a key element of which is using waste water discharge permits and source controls to control pollution.

The TMDL data for the Upper Chehalis River Dry Season Study was collected from July 1991 to April 1993 from stations on the mainstem Chehalis River and from tributaries, point sources, and other loading sources. The mainstem Chehalis River in the study area can be divided into three reaches that exhibit distinct physiographic features. The upper reach of the study area (above the town of Pe Ell to State Route (SR) 6 bridge at RM 74.9) has mixed features of riffles, swift glides, and occasional deeper pools. The middle reach (SR 6 to Skookumchuck River at RM 67.0) is a stretch of slow, relatively deep water referred as the Centralia Reach. The lower reach (Skookumchuck River to Porter at RM 33.8) is much swifter, again exhibiting a riffle/glide/pool character (see Appendix D for "Upper Chehalis River Location Map").

The following TMDL findings were determined for the Centralia Reach of the Chehalis River:

The Centralia Reach is characterized by high surface water temperatures near the water surface and virtually no dissolved oxygen in deeper waters. Dissolved oxygen levels in this section of the river would fall below standards even in the absence of human-caused pollutants. The Centralia Reach does not meet the water quality criteria for dissolved oxygen (DO) under critical conditions, even with loadings reduced to background conditions. Critical conditions occur during low flows and high temperatures in the river. This reach is very sensitive to any loading and the model predicts DO degradation with even small increases in BOD₅ loading.

TMDL load allocations are proposed for ammonia and carbonaceous Biochemical Oxygen Demand (CBOD) for the Chehalis River between Pe Ell and Porter from May 1 to October 31. A key component of the TMDL study is that no loading capacity exists in the Centralia Reach. From Mellen Street upstream to the Newaukum River, the Chehalis River cannot accept the current discharge of ammonia and BOD without a significant degradation (0.2 mg/L or more) of DO below the water quality criteria. Therefore, unless existing pollutant loading sources change, the Chehalis and Darigold WWTP cannot discharge in the Centralia Reach. No point source Wasteload Allocation (WLA) is recommended for the existing City of Chehalis Wastewater Treatment Plant from May 1 to October 31. The permit effluent limitations for BOD₅ and NH₃-N loadings shall be removed in this reach of the river.

No nonpoint source Load Allocation (LA) above background are provided for in the TMDL. This applies to: livestock impacts on the mainstem and on Salzer and Dillenbaugh Creeks and their tributaries; activities that affect ground water quality where the Chehalis River or its tributaries are downgradient; stormwater runoff from urban areas, clean-up sites, and agricultural activities; and poor waste handling activities that result in the discharge of waste to the Centralia Reach or its tributaries.

The Chehalis wastewater treatment plant (WWTP) is located at the upper end of the Centralia Reach and is limited by these water quality wasteload allocations.

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The Darigold processing plant outfall is located approximately 50 feet upstream of the Chehalis outfall. This discharge is also located in the Centralia Reach. Therefore, a zero wasteload allocation for BOD₅ in the TMDL is also recommended for the Darigold discharge.

DESCRIPTION OF THE FACILITY

Treatment Processes

The Chehalis WWTP was originally constructed in 1949. The plant has undergone a number of modifications and upgrades with the assistance of state and federal grant monies. The last major revision occurred in 1987-88 providing more flexibility in handling high plant flows, an additional chlorine contact chamber, and a dechlorination system. The upgrade has resulted in a more complex operational system (see Appendix D for "Figure IV-1 Plant Flow and Design Criteria"). The following is a description of the treatment process:

Treatment consists of grit removal and comminution with a bar screen available for backup as needed. Flow is calibrated semiannually. The plant has two primary clarifiers, trickling filters/activated sludge, and secondary clarifiers which operate in parallel to provide secondary treatment. Each unit can be isolated and taken off-line as necessary for maintenance with flows diverted to the other treatment units. The facility has three chlorine contact basins. During normal dry weather flows, only one basin (No. 2) is used. As flows increase, the other basins are brought on line. The facility provides disinfection using chlorination and dechlorination with sulphur dioxide for flows up to 7.0 MGD. Excessive flows are chlorinated and discharged to the Chehalis River via an overflow weir to Outfall 002 without dechlorination. The sludge (biosolids) is treated by anaerobic digestion and ultimately utilized by land application.

In 1992, the facility serviced a population of 7671 and is projected to serve a population of 10,300 by the year 2013. The WWTP is a Class III facility. The chief operator is certified at the Class III level and has four operators and a lab technician under his supervision. Operators are on duty for one eight hour shift (0800 to 1630 hours), five days a week, do a two-hour check and sample gathering routine on the weekends, and remain on 24 hour call. Domestic, commercial, and industrial wastewaters are collected in a common sewage system and routed via 11 pump stations to the WWTP.

Collection System

The collection system is old and deteriorating and suffers from large volumes of groundwater (infiltration) and stormwater (inflow) entering the system during wet weather. Because of the infiltration and inflow (I/I), the system is experiencing occasional bypasses of raw sewage and the WWTP is not meeting federal and state treatment standards. Therefore in 1988, the Department issued the City a Consent Decree (Order No. DE 85-353) that established an aggressive I/I removal program. The Consent Decree included an aggressive I/I removal program. To establish a schedule for I/I removal and to determine the cost effectiveness of removing I/I, the City prepared an Engineering Report in 1989. Between 1980 and 1988, the City spent approximately \$1,500,000 to remove excess I/I from the collection system. Since 1988, the City has expended approximately \$6.7 million of EPA, state, and City funds to rehabilitate the collection system to remove I/I.

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In November 1993, the City submitted to the Department a cost effective analysis of the collection system I/I removal program. This analysis shows that the total present worth (20 years) of the alternatives studied for further I/I removal are within about 2 percent of each other. This means that the cost effectiveness is statistically the same and meets the requirements of the Consent Decree.

Residual Solids

Sludge is treated by anaerobic digestion. An existing aerobic digester is used as a storage unit for sludge wasted from the secondary anaerobic digester when sludge must be held prior to land spreading. The treatment facility has 14 covered sludge drying beds which are not usually used since the liquid sludge is easier to land spread than the dried sludge. The Lewis County Environmental Health Division regulates the disposal of solid waste in Lewis County. At present the Permittee contracts with two sludge disposal operations within the county. Biorecycling Corporation land application on the Kalberg farm site near Winlock and on the Mr. Bob Thode site near Cinebar.

A solid waste handling facility permit was issued to E. Ron Kalberg and Bio Recycling Corporation for the disposal of sludge from the Chehalis WWTP. The sludge is land applied on the Kalberg farm located near Winlock in Lewis County. The facility is located at 348 Sargent Road (Section 14, Township 12 North, Range 2 West). The land application utilizes approximately 200 acres of a 316 acre farm.

The sludge was analyzed with the Toxicity Characteristic Leaching Procedure (TCLP) in April 1992 as per Appendix II of 40 CFR Part 261, EPA Method 1311. The results reported showed that the secondary anaerobic sludge did not exhibit any toxicity due to leaching. However, because of the different land application sites for the sludge and the industrial contribution to the WWTP, it is important that the Permittee monitor the sludge.

Discharge

The City of Chehalis accepts wastewater for treatment from the City of Napavine, Lewis County Sewer District No. 1, and an industrial park. The WWTP has a monthly average dry and wet weather design flow of 2.0 and 4.0 million gallons per day (MGD) and an instantaneous peak design flow of 13.0 MGD. An analysis of the DMR data over the last three years shows that the facility discharges an annual average of 1.58 MGD into the Chehalis River. The Chehalis WWTP outfall consists of a 24-inch reinforced concrete pipe that extends over 500 feet from the chlorine contact tank to the river. The outfall pipe was inspected on September 16, 1992, as part of the Mixing Zone Study. The outfall structure is in very poor structural condition. The outfall is buried for entire length to the river bank, it emerges from the riverbank on the east shore, and it extends approximately 35 feet (on pile supports) into the Chehalis River. The outfall pipe discharges above the water surface level at low river flow stage. The outfall terminates with a single 24-inch port that is oriented perpendicular to the river flow.

The annual average daily discharge as described in the NPDES permit application is characterized by the following regulated parameters:

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<u>Parameter</u>	<u>Annual Average Daily Discharge</u>
Flow	1.19 MGD
pH	6.6 to 7.4 standard units
Temperature (winter)	53.7 ⁰ F
Temperature (summer)	66.2 ⁰ F
Fecal Coliform	30/100 ml
Biochemical Oxygen Demand (BOD 5-day)	16.8 mg/l
Chlorine (Total Residual)	0.10 mg/l
Total Suspended Solids (TSS)	19.0 mg/l
Dissolved Oxygen (DO)	6.75 mg/l

PREVIOUS EFFLUENT LIMITATIONS

Previous Permit

The previous permit for this facility was issued on December 10, 1990. The previous permit placed effluent limitations on flow, 5-day Biochemical Oxygen Demand (BOD₅), Total Suspended Solids (TSS), pH, Fecal Coliform, and total residual chlorine.

<u>Parameter</u>	<u>EFFLUENT LIMITATIONS</u>	
	<u>Monthly Average</u>	<u>Weekly Average</u>
Flow	4.0 MGD	n/a
BOD (5 day)*	30 mg/l, 555 lbs/day	45 mg/l, 833 lbs/day
Total Suspended Solids*	30 mg/l, 455 lbs/day	45 mg/l, 683 lbs/day
Fecal Coliform Bacteria	200/100 ml	400/100 ml
pH	Shall not be outside the range of 6.0 to 9.0	
Total Residual Chlorine	No detectable residual up to 7.5 MGD	

For flows in excess of 7.5 MGD discharged without dechlorination, total available (residual) chlorine shall be minimized. Residual chlorine shall not exceed the amount required to achieve the fecal coliform limit specified above.

* The monthly average effluent concentration limitations for BOD₅ and TSS shall not exceed 30 mg/l or 15 percent of the respective influent concentrations, whichever is more stringent.

Consent Order

Previously to 1985, Chehalis was regulated under orders establishing a sewer moratorium. On December 1, 1988, Chehalis entered into a Consent Decree No. 88 202704 5 to undertake a ten year sewer rehabilitation program which will effectively eliminate large quantities of infiltration and inflow (I/I) from the wastewater collection system. The Consent Decree contains the following Interim Effluent Limitations:

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<u>Parameter</u>	<u>EFFLUENT LIMITATIONS</u>	
	<u>Monthly Averages***</u>	<u>Daily Averages***</u>
Biochemical Oxygen Demand (5-day)*	45 mg/l, 1200 lbs/day	60 mg/l, 1800 lbs/day
Suspended Solids*	45 mg/l, 1200 lbs/day	80 mg/l, 2200 lbs/day
Fecal Coliform Bacteria	200/ 100 ml	400/100 ml (weekly Average)
pH	Shall not be outside the range 6.0 to 9.0	
Total Residual Chlorine**		

*The monthly average for BOD and TSS shall not exceed 45 mg/l or 35 percent of the respective influent concentration, whichever is more stringent.

**No chlorine residual shall be detected up to 7.5 MGD in the final effluent measured by amperometric analysis.

***The Permittee shall provide efficient operation of all treatment units so as to achieve the highest quality effluent possible, regardless of permit limitations.

SUMMARY OF COMPLIANCE WITH THE PREVIOUS PERMIT AND CONSENT ORDER

The facility received its last inspection on October 13, 1994 (Class I). Class 2 inspections were conducted on the following dates: August 26-28, 1991, July 20-21, 1992, and August 4-5, 1992. Deficiencies in WWTP operation and maintenance were noted and corrected by the City.

Discharge Monitoring Reports (DMRs) submitted to the Department between December 1990 and October 1994 are summarized below. This data was analyzed using the EPA manual titled "Technical Support Document For Water Quality-based Toxics Control" Appendix E (EPA/505/2-90-001). The data shows that during the history of this permit, the Permittees has basically remained in compliance with the consent order. Based on DMRs submitted to the Department and inspections conducted by the Department, the discharge from the WWTP has exceeded the effluent limitations in the permit. However, the consent order has delayed the implementation of these effluent limitations until the I/I removal program is completed and all cost effective I/I is removed.

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TABLE OF INFLUENT AND EFFLUENT LIMITATION EXCEEDANCE

Parameter	Monthly Average Permit Limit*	Weekly Average Permit Limit*	Monthly Average Consent Order Limit*	Daily Average Consent Order Limit*	95th percentile analysis (DMR data for last three years)**	
					'92-'94	Dry (Wet)
Flow (4.0 MGD)	0 (0)	n/a	n/a	n/a	2.96	1.63 (3.05)
BOD ₅ -design influent (3700 lbs/day)	0 (0)	n/a	n/a	n/a	2764	2289 (2814)
TSS - design influent (3100 lbs/day)	4 (0)	n/a	n/a	n/a	3106	2425 (3173)
BOD ₅ - effluent monthly 30/45 mg/l; weekly 45 mg/l; daily 60 mg/l***	2 (0) n/a n/a	n/a 0 (0) n/a	0 (0) n/a n/a	n/a n/a 0 (0)	17.5	17.2 (17.8)
TSS - effluent monthly 30/45 mg/l; weekly 45 mg/l; daily 80 mg/l	4 (1) n/a n/a	n/a 3 (1) n/a	0 (0) n/a n/a	n/a n/a 1 (1)	21.3	18.7 (23.7)
BOD ₅ -effluent monthly 555/1200 lbs/day; weekly 833 lbs/day; daily 1800 lbs/day	0 (0) n/a n/a	n/a 8 (4) n/a	0 (0) n/a n/a	n/a n/a 0 (0)	280	156 (392)
TSS - effluent monthly 465/1200 lbs/day; weekly 698 lbs/day; daily 2200 lbs/day	11 (4) n/a n/a	n/a 13 (6) n/a	0 (0) n/a n/a	n/a n/a 6 (1)	689	229 (976)
BOD ₅ - effluent monthly 85/65% removal	15 (6)	n/a	0 (0)	n/a	86.3	91.6 (83.1)
TSS - effluent monthly 85/65 % removal	15 (6)	n/a	1 (1)	n/a	82.9	90.8 (78.3)
Fecal Coliform, monthly 200/200 /100ml; weekly 400 /100ml	0 (0) n/a	n/a 1 (0)	0 (0) n/a	n/a n/a	35	42 (34)
pH (6.0 to 9.0)	0 (0)	0 (0)	0 (0)	0 (0)	6.2/8	6/7.4 (6.9/8)
Total Chlorine Residual, (0.00 mg/l)	? (0)	? (0)	? (0)	? (0)	0.01	0.05 (0.00)
Total Exceedances	51 (17)	25 (11)	1 (1)	7 (2)	30	1 (29)

* Number of exceedances are listed as # (#). First number indicates number of exceedances for term of the permit between December 1990 through August 1994. Second number indicated in parenthesis are the number of exceedances during the 36 month period from September 1991 through August 1994.

** First number indicates annual analysis, second is dry season analysis, and the third number (in parenthesis) indicates wet season analysis.

*** Monthly "##/" is limits for permit/consent order monthly average; Weekly "/" is limit for permit weekly average; Daily "#" is limit for consent order daily maximum.

? Total Chlorine Residual for first 18 months reported as pre-dechlorination total chlorine residual.

An analysis of the DMR data show:

Approximately 92 percent of permit limitation exceedances occur in the wet season (November through April). However, over the last 24-months, over 96 percent have occurred in the wet season.

Approximately 70 percent of the total number of exceedances of the permit, consent order, and design limits are associated with total suspended solids.

WASTEWATER CHARACTERIZATION

An application for permit renewal was submitted to the Department on June 24, 1994, and accepted by the Department on September 23, 1994.

The annual average daily discharge as described in the NPDES application is characterized for the following regulated parameters:

<u>Parameter</u>	<u>Annual</u>	<u>Average</u>	<u>Daily</u>
<u>Discharge</u>			
Flow	1.19 MGD		
pH	6.6 to 7.4 units		
Temperature, effluent (winter)	53.7 ° F		
Temperature, effluent (summer)	66.2 ° F		
BOD 5-day	16.8 mg/l		
Chlorine-Total Residual	0.10 mg/l		
Total Suspended Solids	19.01 mg/l		
Ammonia (as N)	17.8 mg/l		
Nitrate (as N)	18.66 mg/l		
Nitrite (as N)	1.32 mg/l		
Dissolved Oxygen	6.75 mg/l		

The Permittee completed an Industrial Wastewater Survey, dated June 27, 1994, and reported influent and effluent pollutant monitoring data on a quarterly basis since

December 1993. The results of the survey and monitoring data was analyzed for local pretreatment limits based on existing dilution ratios in the Chehalis River (see Appendix A). An analysis of the pollutants indicates that the metals, copper, silver, and zinc have a reasonable potential to cause water quality problems. See sections "**Water Quality-Based Limits for Numeric Criteria**" for water quality limits for pollutants of concern. The chemical Aldrin was detected in the effluent with the priority pollutant scan that was sampled on December 27, 1993. However, the influent sampled that same day showed a non-detect. This discrepancy may be caused by stormwater inflow into the collection system or a sample or lab contamination; therefore, the permit will require additional monitoring to verify actual presence and concentration.

PROPOSED PERMIT LIMITATIONS AND CONDITIONS

Federal and state regulations require that effluent limitations set forth in a NPDES permit must be either technology or water quality based. Technology-based limitations are set by regulation (40 CFR 133, and Chapters 173-220 and 173-221 WAC). Water quality-based limitations are based upon compliance with the Water Quality Standards (Chapter 173-201A) and the TMDL limits. The more stringent of these two limits must be chosen for each of the parameters of concern. Each of these types of limits is described in more detail below.

DESIGN CRITERIA

In accordance with WAC 173-220-150(1)(g), flows or waste loadings shall not exceed approved design criteria.

The design criteria for this treatment facility are as follows:

Monthly average flow (max. wet month):	4.00 MGD
Monthly average flow (max. dry weather):	2.00 MGD
Instantaneous peak flow:	13.00 MGD
BOD influent loading:	3700 lbs/day
TSS influent loading:	3100 lbs/day
Design population equivalent:	13,000

TECHNOLOGY-BASED EFFLUENT LIMITATIONS

Municipal wastewater treatment plants are a category of discharger for which technology-based effluent limits have been promulgated by federal and state regulations. These effluent limitations are given in the Code of Federal Regulations (CFR) 40 CFR 133 (federal) and in Chapter 173-221 WAC (state). These regulations are performance standards that constitute all known, available and reasonable methods of treatment for municipal wastewater.

The following technology-based limits are taken from Chapter 173-221 WAC:

pH: shall be within the range of 6 to 9 standard units.

Fecal Coliform Monthly Geometric Mean = 200 colonies/100 ml

Bacteria: Weekly Geometric Mean= 400 colonies/100 ml

BOD₅: Average Monthly Limit is the most stringent of the following:

- 30 mg/L
- may not exceed 15 percent of the average influent concentration.

TSS: Average Monthly Limit is the most stringent of the following:

- 30 mg/L
- may not exceed 15 percent of the average influent concentration.

The following technology-based limits are based on WAC 173-220-130(3)(b) and 173-221-030(11)(b). Effluent mass loadings (lbs/day) were calculated as follows:

Average dry weather design flow (2.00 mgd) x Concentration limit (30 mg/L) x 8.34 (conversion factor) = mass limit (500 lbs/day). However, the treatment process is designed for an influent BOD loading of 3700 lbs/day and a TSS influent loading of 3100 lbs/day; therefore, at 85 percent removal, the effluent BOD limit would be 555 lbs/day (3700 x 0.15) and effluent TSS limit would be 465 lbs/day (3100 x 0.15).

Weekly average effluent mass loading = 1.5 x monthly loading.

Performance based interim limits were determined by using EPA's "Technical Support Document For Water Quality-based Toxics Control" (Appendix E). The data best fit the log-normal distribution method and was used. The monthly average 95 percentile analysis (Log-Normal) for BOD₅ and TSS are as follows:

(May through October). An analysis of the last three years of DMR data shows that the WWTP can consistently achieve 30 mg/L and 85 percent removal of both BOD₅ and TSS during the dry season. The City of Chehalis has re-introduced the activated sludge process to the treatment sequence and have been consistently achieving effluent concentrations below 30 mg/L (see letter from Barry Heid, City of Chehalis, to Darrel Anderson, Ecology, dated August 23, 1995). The City has proposed the following interim effluent limits to Ecology that the WWTP can meet at this time:

<u>Parameter</u>	<u>Monthly Average</u>	<u>Weekly Average</u>
BOD ₅	20 mg/L	30 mg/L
TSS	20 mg/L	30 mg/L
Ammonia	2 mg/L	5 mg/L
Effluent DO	8 mg/L	8 mg/L

The City's effort in this area is important to the overall success of the TMDL process; therefore, these limits will be accepted as the effluent limits for this permit cycle. The compliance process will contain a schedule (Ecology issued Order) for achievement of the TMDL goal for the Chehalis River. These interim limits will be protective of the 5 mg/L dissolved oxygen requirement when the non-point sources and the sediment oxygen demand meet the limits adopted in the TMDL assumed limits (see WAC 173-201A.130(9)).

(November through April). During the wet season, the analysis shows the following operational performance at the WWTP for percent removal and concentrations:

		<u>BOD₅</u>	<u>TSS</u>
75%)	Percent removal	79.1% (Use 75%)	76.5% (Use
mg/L)	Concentration	17.9 mg/L (Use 30 mg/L)	21.5 mg/L (Use 30

The BOD₅ influent design loading of 3700 lbs/day limits the effluent discharge loadings at 75 percent removal to 925 lbs/day (3700 x 0.25). TSS influent loading of 3100 lbs/day limits the effluent discharge loadings at 75 percent removal to 775 lbs/day (3100 x 0.25). The analysis of the DMR data shows that the TSS discharge mass loadings at the 95th percentile equals 976 lbs/day.

Effluent Limitations (May through October/Design flow = 2.00 MGD)

<u>Parameters</u>	<u>Monthly Average</u>	<u>Weekly Average</u>
BOD ₅ *	20 mg/l, 334 lbs/day	30 mg/l, 500 lbs/day
TSS*	20 mg/l, 334 lbs/day	30 mg/l, 500 lbs/day
Total Chlorine Residual	0.011 mg/L	0.022 mg/L
<u>Parameters</u>	<u>Monthly Average</u>	<u>Daily Maximum</u>
Ammonia (NH ₃ -N)	2.0 mg/L	5.0 mg/L

* The average monthly effluent concentration for BOD₅ and Total Suspended Solids shall not exceed 20 mg/L or 15 percent of the respective monthly average influent concentrations, whichever is more stringent.

Effluent Limitations (November through April/Design flow = 4.00 MGD)

<u>Parameters</u>	<u>Monthly Average</u>	<u>Weekly Average</u>
BOD ₅ *	30 mg/l, 925 lbs/day	45 mg/l, 1387 lbs/day
TSS*	30 mg/l, 775 lbs/day	45 mg/l, 1162 lbs/day
Total Chlorine Residual	0.012 mg/L	0.025 mg/L
<u>Parameters</u>	<u>Monthly Average</u>	<u>Daily Maximum</u>
Ammonia (NH ₃ -N)	17 mg/L	19 mg/L

* The average monthly effluent concentration for BOD₅ and Total Suspended Solids shall not exceed 30 mg/L or 25 percent of the respective monthly average influent concentrations, whichever is more stringent.

The consent decree (previously issued) stipulated that the City shall achieve compliance with secondary treatment effluent limitations contained in its NPDES permit no later than July 1, 1999. These limitations are subject to modification

contingent on the Department's approval of a Permittee's application for relief under WAC 173-221-050(1), alternate trickling filter effluent limits. The Permittee's cost effectiveness analysis was subsequently accepted by the Department. The results of the analysis showed that all cost effective excessive I/I has been removed and the remaining I/I will be treated at the WWTP.

Alternative domestic wastewater facility discharge standards and effluent limitations for trickling filters constructed and/or expanded prior to November 1984 allow the following:

The monthly average percent removals of BOD₅ and TSS shall not be less than 65 percent of the influent concentrations nor less stringent than "effluent concentrations consistently achievable through proper operation and maintenance" as defined in WAC 173-221-030(11).

The City submitted a WWTP capacity evaluation report (approved May 15, 1995) that shows projected influent BOD₅ and TSS treatment loading capacities. The loading capacities are dependent upon the completion of recommended modifications to the WWTP and identified operational changes. The City completed the construction of those modifications and will begin the operational changes in September 1995. The influent loading capacities at the WWTP for BOD₅ and TSS are 4880 lbs/day and 5123 lbs/day, respectively. Therefore, revised effluent discharge loadings for BOD₅ and TSS are 1000 lbs/day ($4880 \times 0.209 = 1020$ and $5123 \times 0.22 = 1127 > 30 \text{ mg/L} \times 4.0 \text{ MGD} \times 8.34 = 1000 \text{ lbs/day}$).

The discharge from the WWTP will have to meet the effluent limits set in the TMDL by the schedule set in an Ecology issued Order. The WWTP performance limits submitted by the City of Chehalis will become the interim limits until the WWTP discharge meets final effluent limits. See below "Water Quality-Based Effluent Limitations - Schedule For Meeting Final Effluent Limits."

WATER QUALITY-BASED EFFLUENT LIMITATIONS

In order to protect existing water quality and preserve the designated beneficial uses of Washington's surface waters, WAC 173-201A-060 states that waste discharge permits shall be conditioned such that the discharge will meet established Water Quality Standards. The Washington State Water Quality Standards (Chapter 173-201A WAC) is a state regulation designed to protect the beneficial uses of the waters of the state. Several major elements of the state's Water Quality Standards are discussed below.

Numerical Criteria

"Numerical" water quality criteria are numerical values set forth in the state of Washington's Water Quality Standards (Chapter 173-201A WAC), which specify the allowable levels of pollutants in a receiving water. Numerical criteria for dissolved oxygen and turbidity are among the criteria contained in WAC 173-201A-030. Numerical criteria are also listed for many toxic substances including chlorine and ammonia (WAC 173-201A-040). Numeric criteria set forth in the Water Quality Standards are used to derive the effluent limits in a discharge permit. When water quality-based limits are more stringent or potentially more stringent than technology-based limitations, they must be used in a permit.

Narrative Criteria

In addition to numerical criteria, "narrative" water quality criteria (WAC 173-201A-030) are used to limit acute and chronic toxicity, radioactivity, and other deleterious materials, and prohibit the impairment of the aesthetic value of the waters of the state. Narrative criteria describe the specific beneficial uses of all fresh (WAC 173-201A-130) and marine (WAC 173-201A-140) waters in the state of Washington.

Antidegradation Policy

The state of Washington's Antidegradation Policy requires that discharges into a receiving water shall not further degrade the existing water quality of the water body. In cases where the natural conditions of a receiving water are of lower quality than the criteria assigned, the natural conditions shall constitute the water quality criteria. Similarly, when the natural conditions of a receiving water are of higher quality than the criteria assigned, the natural conditions shall constitute the water quality criteria. More information on the state Antidegradation Policy can be obtained by referring to WAC 173-201A-070.

Mixing Zones

The Water Quality Standards allow the Department to authorize mixing zones around a point of discharge in establishing water quality-based effluent limits. Both "acute" and "chronic" mixing zones may be authorized for pollutants that can have a toxic effect on the aquatic environment at the point of discharge. The concentration of pollutants at the edge of these mixing zones may not exceed the numerical criteria for that type of zone. Mixing zones can only be authorized for discharges that are receiving all known, available, and reasonable methods of prevention and control (AKART). The previous permit required an effluent mixing study to be completed and submitted to the Department to coincide with the TMDL study. This study was completed and received by the Department on February 11, 1993. The minimum dilutions reported in the mixing (dye) study were 8:1 for the acute zone and 22:1 for the chronic zone. However, the critical dilution ratios were determined using the percent of flow in the receiving water (25 percent for chronic; 2.5 percent for acute). See below for description of acute and chronic mixing zones.

Mixing Zone Authorization

Because of the reasonable potential for pollutants in the proposed discharge to exceed water quality criteria, mixing zones may be authorized. These zones will accommodate the geometric configuration and flow restriction for mixing zones in Chapter 173-201A WAC and are defined as follows:

- (i) Not extend in a downstream direction for a distance from the discharge port greater than three hundred feet plus the depth of water over the discharge port, or extend upstream for a distance of over one hundred feet;
- (ii) Not utilize greater than twenty-five percent of the flow; and
- (iii) Not occupy greater than twenty-five percent of the width of the water

body.

The Water Quality Standards (WAC 173-201A-020) specify that "critical conditions may be assumed to be equal to the 7Q10 flow event" for the standards compliance, "unless determined otherwise by the department." Because the Centralia Reach of the Chehalis River between the Newaukum and the Skookumchuck Rivers is ungaged, use of a 7Q10 for critical flow conditions in this stretch was not feasible. In addition, this stretch of the river is governed by a special condition that creates two separate DO criteria for semiannual periods and, therefore, critical flow conditions must be separately defined for each of the two semiannual periods.

The critical low flow conditions in 1992 created a fortunate situation where critical flow could be evaluated from real time measurements. Therefore, the mainstem Chehalis River critical condition low flows used for modeling were 68 cubic feet per second (cfs) above the Skookumchuck River and 59 cubic feet per second (cfs) below the Newaukum River. In a previous letter sent to the City dated June 17, 1993, was included a preliminary TMDL critical flow in the Chehalis River of 50 cfs. As noted in the letter:

"The analysis of the Chehalis mixing zone is complicated by the fact that the Darigold outfall is a short distance upstream, which produces an overlapping mixing zone. The Department's Water Quality Standards, Chapter 173-201A, provides for overlapping mixing zones. However, the combined mixing zone cannot be larger than a single dilution zone would allow. The most straightforward calculation is to combine the effluent flows and treat them as one discharge. Fortunately, this is possible for these discharges since the 7Q10 flow in the river is the most stringent requirement in determining available mixing for these discharges."

Since the actual TMDL critical flow is 60.2 cfs for May through October, the dilution factors were revised and the water quality permit limitations recalculated as follows:

Chronic Zone: The most restrictive parameter for the mixing zone allowable under WAC 173-201A-100 is 15.05 cfs, 25 percent of the 7Q10 flow. The combined discharge is 3.58 cfs: Chehalis at 1.73 MGD (2.68 cfs) and Darigold at 0.6 MGD (0.9 cfs). The dilution ratio (upstream flow to effluent flow) is used to calculate effluent limits. The dilution ratio (DR) is related to the dilution factor (DF), or the inverse of percent effluent, by: $DR + 1 = DF$. The dilution factor equals 5.20.

Acute Zone: The most restrictive parameter for the mixing zone under WAC 173-201A-100 is 2.5 percent of the 7Q10 flow. Following the same analysis as above (7Q10 = 60.2 cfs; at 2.5% = 1.505 cfs; combined discharge = 7.55 cfs; highest daily plant flow during this critical period at Chehalis = 4.29 MGD (6.65 cfs) and Darigold = 0.6 MGD (0.9 cfs) the dilution factor equals 1.20.

For November through April the dilution factors were based on the wet season 7Q10 flow of 218.6 cfs. The river velocities for the winter flow are not predicted to increase significantly. An estimated two foot rise (top of outfall pipe) would only increase the river velocity to 0.09 fps. Since the velocity of the discharge would still be dominate, the percent of flow was assumed to be the control and used to determine critical chronic and acute dilution factors.

Chronic Zone: 25% of Chehalis River flow equals 54.65 cfs; highest monthly average flow (last three years data) = 3.10 MGD (4.79 cfs); Darigold design flow = 0.60 MGD (0.90 cfs); total flow = 5.69 cfs; dilution factor = 10.6.

Acute Zone: 2.5% of Chehalis River flow equals 5.465 cfs; highest daily maximum flow (last three years data) = 10.0 MGD (15.5 cfs); Darigold design flow = 0.60 MGD (0.90 cfs); total flow = 16.4 cfs; dilution factor = 1.35.

Water Quality-Based Limits for Numeric Criteria

Pollutants in an effluent may affect the aquatic environment near the point of discharge (near field) or at a considerable distance from the point of discharge (far field). Toxic pollutants, for example, are near-field pollutants--their adverse effects diminish rapidly with mixing in the receiving water. Conversely, a pollutant such as BOD is a far-field pollutant whose adverse effect occurs away from the discharge even after dilution has occurred. Thus, the method of calculating water quality-based effluent limits varies with the point at which the pollutant has its maximum effect.

The derivation of water quality-based limits also takes into account the variability of the pollutant concentrations in both the effluent and the receiving water. Water quality-based limits are derived for the waterbody's *critical condition*, which represents the receiving water and waste discharge condition with the highest potential for adverse impact on the aquatic biota and existing or characteristic water body uses. In the Chehalis River Centralia Reach area, the critical conditions occur during the dry season when the river is at the 7 day 10 year low flow, velocities are very slow (< 0.3 to 1.2 days per mile), and temperatures are warm (> 20 °C).

Water Quality Modeling Methods (TMDL)--The Chehalis River system (RM 33.8 to RM 108.2) was modeled using version 5.10 of the WASP5 model, with its eutrophication kinetic subroutine EUTRO5 (Ambrose *et al.*, 1993). This model is supported by EPA. WASP5 allows time-dependent, three-dimensional modeling of oxygen, nutrients, BOD, and phytoplankton and conservative parameters.

BOD--The impact of BOD on the receiving water was modeled using the WASP5 Model at critical receiving water conditions and with the technology-based effluent limitation for BOD described above. The TMDL field testing results and model calculations used to determine the WLA for BOD are available from the Department upon request. Title of document is "Upper Chehalis River Total Maximum Daily Load Study, July 1994" (>300 pages).

Under critical conditions, the model predicts a violation of the dissolved oxygen criterion for the receiving water. The TMDL recommends no WLA for BOD₅ effluent from the Chehalis and Darigold WWTPs from May 1 through October 31. Even with a WLA of zero for the Chehalis WWTP and for all other point sources, DO levels did not meet the 8.0 mg/l criterion because natural conditions are a further limiting factor.

The impact of temperature, fecal coliform, chlorine, ammonia, metals, and other toxics were modeled as shown below, using dilution factors described above.

Temperature--The impact of the discharge on the temperature of the receiving water was modeled by simple mixing analysis at receiving water and waste discharge conditions that represent the highest potential for adverse impact on aquatic biota and existing or characteristic water body uses. These conditions define the "critical condition" of the water body. The receiving water temperature at the critical condition and the effluent temperature are statistically correlated to each other. What this means is that when WWTP temperatures are high so is river temperatures and vice versa. The predicted resultant temperature at the boundary of the chronic mixing zone will not exceed the 0.3 °C increase in temperatures in the receiving waters.

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Under these conditions there was no prediction of a violation of the temperature criterion for the receiving water.

Fecal Coliform--The water quality standards (Class A freshwater) for fecal coliform is 100 colonies/ 100 mL. The numbers of fecal coliform were modeled by simple mixing analysis using the technology-based limit of 400 colonies per 100 ml and a dilution factor of 4.76. The technology-based limit was found to meet the Water Quality Standards.

Under these conditions there is no predicted violation of the Water Quality Standards.

Toxic Pollutants--Federal regulations (40 CFR 122.44) require NPDES permits to contain effluent limits for toxic chemicals in an effluent whenever there is a reasonable potential for those chemicals to exceed the water quality criteria. This process occurs concurrently with the derivation of technology-based effluent limits. Facilities with technology-based effluent limits defined in regulation are not exempted from meeting the Water Quality Standards or from having water quality-based effluent limits.

The Department has determined that the applicant has ammonia and total residual chlorine, and the metals copper, silver, and zinc in their effluent. A determination of the reasonable potential of these pollutants to cause a violation of the Water Quality Standards is therefore required.

The determination of the potential of a chemical to violate the Water Quality Standards is contingent, in part, upon the amount of mixing that occurs in an assigned mixing zone. In this case, the Department has determined that a mixing zone is required because the effluent exceeds the water quality criteria with technology-based controls. If the Department finds that a reasonable potential to violate the Water Quality Standards exists for any toxic chemical, then the permit will be modified to include effluent limits for those chemicals.

The determination of the reasonable potential for ammonia, total chlorine residual, copper, silver, and zinc to exceed the water quality criteria was conducted using receiving water and waste discharge conditions that represent the highest potential for toxicity in the receiving water environment. This condition is called the *critical condition*. The critical condition in this case occurs from May through October. The parameters used in the critical condition modeling are as follows:

(May through October)

The acute dilution factor 1.14; chronic dilution factor 5.00; receiving water temperature 23.40 °C; receiving water hardness 50 (as mg CaCO₃/L), and pH = 7.30

(November through April)

The acute dilution factor 1.31; chronic dilution factor 10.50; receiving water temperature 9.70 °C; receiving water hardness 50 (as mg CaCO₃/L), and pH = 7.53

No reliable ambient background pollutant data is available for the Chehalis River upstream of the WWTP discharge (ammonia is an exception @ 0.05 mg/L). For the purpose of this permit, it was assumed that the ambient concentrations for other pollutants of concern are equal to zero. Therefore, additional monitoring data may be required for the discharge prior to meeting final effluent limits in this permit.

The reasonable potential for exceeding water quality criteria was evaluated with procedures given in EPA, 1991, as shown in Appendix C.

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Effluent limits were derived for ammonia, total chlorine residual, copper, silver, and zinc which were determined to have a reasonable potential for violation of the Water Quality Standards.

Effluent limits were calculated using methods from EPA, 1991, as shown in Appendix C.

The resultant effluent limits for May through October are as follows:

<u>Parameter</u>	<u>Monthly Average</u>	<u>Weekly Average</u>	<u>Daily</u>
<u>Maximum</u>			
Ammonia-N ^x	4.40 mg/L	6.60 mg/L	9.00
mg/L			
Chlorine**	0.011 mg/L	0.022 mg/L	n/a

<u>Parameter*</u>	<u>Quarterly Average</u>	<u>Daily Maximum</u>
Copper	8.90 µg/L	10.10 µg/L
Silver***	1.05 µg/L	1.19 µg/L
Zinc	63.8 µg/L	72.5 µg/L

*TMDL provides 0.0 lbs/day for ammonia discharge to the Chehalis River (Centralia Reach)

**Total residual

*** The Permittee will be issued an Administrative Order or an amended permit to include a schedule for meeting the final discharge limit for silver, as noted above.

The resultant effluent limits for November through April are as follows:

<u>Parameter</u>	<u>Monthly Average</u>	<u>Weekly Average</u>	<u>Daily</u>
<u>Maximum</u>			
Ammonia	7.80 mg/L	11.7 mg/L	16.1
mg/L			
Chlorine**	0.012 mg/L	0.025 mg/L	n/a

<u>Parameter</u>	<u>MonthlyAverage</u>	<u>Daily Maximum</u>
Copper	10.20 µg/L	11.60 µg/L
Silver***	1.21 µg/L	1.37 µg/L
Zinc	73.4 µg/L	83.3 µg/L

**Total residual

*** The Permittee will be issued an Administrative Order or an amended permit to include a schedule for meeting the final discharge limit for silver, as noted above.

The effluent limit for silver is associated with the industrial contribution to the sewer system. The Permittee's Administrative Order (DE 95WQ-S275) requires the City to adopt an ordinance to establish local limits for certain metals (i.e., silver). When these local limits are established, the Department will issue a final permit to that industry for meeting the local limit for silver. The industry will be required to meet final local limits by the schedule identified in their final permit. The Permittee will then be issued an Administrative Order or an amended permit to include a schedule for meeting the final

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discharge limit for silver as noted above.

The Permittee is required to meet the following Interim Effluent Limits for Toxic Pollutants:

<u>Parameter</u>	<u>Quarterly Average</u>	<u>Daily Maximum</u>
Copper	n/a	20.1 ug/L, 300 grams/day
Silver (Existing)*	14.3 ug/L	25.6 ug/L, 400 grams/day
Silver (Interim)**	5.5 ug/L	13.0 ug/L, 200 grams/day
Zinc	n/a	69.5 ug/L, 850 grams/day

*The existing silver discharge limit for Qualex is 2.0 mg/L and is in effect until December 31, 1995. The Permittees shall meet the effluent limit for Silver (Existing), as noted above, with the issuance of this permit.

**Qualex is required by their existing permit (No. ST5099) to meet a maximum day silver discharge limit of 1.0 mg/L and a quarterly (4/year) average of 0.4 mg/L by January 1, 1996. The Permittees shall meet the effluent limits for Silver (Interim), as noted above, at that time.

The Permittee's Silver (Existing/Interim) limits were based on concentration of silver in the influent to the WWTP (Qualex @ 2.0 mg/L, 1.0 mg/L and 0.4 mg/L), reduction in silver concentrations through the WWTP process (75 percent), discharge dilution factors in the Chehalis River (Acute dilution factor = 2.13), and Acute Water Quality limits for silver (1.393 ug/L). Qualex is required by their permit to submit monthly Discharge Monitoring Reports (DMRs) to the Department reporting daily maximum concentrations of silver discharged from their facility. When the industry samples the discharge more than once during that month, minimum and average concentration are also reported. Qualex is also required to submit with the DMRs a quarterly average (4/year) in accordance with their Administrative Order.

Schedule For Meeting Final Metals Effluent Limits

The Permittee will have the following schedule to meet effluent limits for copper and zinc:

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TMDL-BASED STRATEGY FOR MEETING WATER QUALITY LIMITS

Implementation of the actions necessary to achieve this TMDL will occur in phases. The long-term goal of the Department's Water Quality Program is to use the information presented in the TMDL study to protect beneficial uses and achieve state water quality standards in the mainstem and tributaries of the upper Chehalis watershed.

Implementation of Point Source Controls

Currently two measures of water quality linked to point source discharges are failing to meet state water quality standards: dissolved oxygen and temperature. The primary area of concern in the Chehalis River related to point sources is that portion of the river between Chehalis and Centralia. This portion of the river is referred to in the TMDL study as the "Centralia Reach." A second area of concern is that portion of the river immediately below Centralia. The major point source discharges affecting these portions of the river are the municipal wastewater discharges from the cities of Chehalis and Centralia and the industrial discharge from the Darigold milk processing plant.

The current water quality standard for this segment of the Chehalis River is 5.0 mg/l dissolved oxygen from June 1 through September 15, and 8.0 mg/l dissolved oxygen from September 16 through May 31.

The pollution control strategy for addressing these point sources and meeting the state water quality standards includes:

- a wasteload allocation of zero for the City of Chehalis and Darigold,
- a limited wasteload allocation for the City of Centralia,
- NPDES permits and a companion order for the City of Chehalis that identify interim limits and schedules of activities that must be accomplished.

The short-term strategy--applied to the current five-year permit cycle that runs until the year 2000--will be to base limits from May 1 through November 1 on the 5.0 mg/l standard for dissolved oxygen, even though the standard of 8.0 mg/l from September 16 through May 30 overlaps that time period for approximately ten weeks each year. The City of Chehalis (and Centralia) should be able to accomplish this if ammonia meets toxicity based limits in the mixing zone, since the ammonia toxicity limits fall within the allowable load for ammonia under the TMDL. This assumption is based on all nonpoint sources being cleaned up and sediment oxygen demand is reduced over time.

Even though the above paragraph states that the City should be able to meet the limits proposed for the current permit cycle if ammonia meets toxicity-based limits in the mixing zone, the relationship in this case is purely circumstantial. There is a distinct difference between the toxicity based

ammonia limits contained in the NPDES permit and the TMDL “limits” (wasteload allocations). This previous paragraph does not imply that we are adopting the ammonia toxicity based limits as the TMDL limits.

Discharge limits in the proposed NPDES permit for the City will be weekly averages of 30 mg/l BOD and 5 mg/l NH₃. These are the limits achieved during the City’s pilot effluent filtration study carried out during the summer months of 1995. A companion order to the permit will identify specific actions that the City of Chehalis needs to accomplish and establish a schedule for accomplishing those actions. The companion order will be negotiated between the Department and City of Chehalis and should be completed prior to issuance of the permit.

The long-term strategy for years six through ten is to meet the established water quality standard criteria of 8.0 mg/l in the spring (between May 1 and June 1) and fall (from September 15 to October 1) or to meet adjusted water quality criteria that may be adopted based on studies of historical and actual or potential use. At a minimum, there should be no degradation of the river below that caused by natural conditions.

Local actions under consideration include:

- Prepare budget estimates for short-term activities,
- Arrange funding for short-term activities,
- Continue pilot effluent filtration study and submit report for review,
- Complete a re-aeration study (this is not required but it is acceptable to the Department),
- Complete a facility planning study and submit report for review,
- Continue nitrification study and evaluation and submit report for review,
- Combine outfalls or wastewaters of Chehalis and Darigold,
- Build a new outfall,
- Install a river gauging station,
- Arrange funding for long-term actions,
- Begin implementation of long-term actions,
- Develop acceptable solutions that deal with the rivers sensitivity to upset (this can be accomplished by ensuring that a system failure will not occur or having a contingency plan in case it does),
- Monitoring to measure effectiveness of facility improvements.

In support of reducing the pollutant load from point sources during the current permit cycle (the short-term) the Department will develop five-year NPDES permits for Darigold, Centralia, and Chehalis with companion orders. The permit will include interim limits and special conditions. The companion order will include the long-term strategy and timelines.

The Department will also evaluate beneficial uses within the upper Chehalis watershed using historical information and assessment of the potential uses based on current river conditions. These beneficial uses will be compared to existing water quality criteria to determine if adjustments the criteria should be considered. If adjustments are made, the long-term permit limits will be based on the adjusted criteria. This evaluation will be identified as a priority action in the needs assessment being prepared to guide agency actions for the next five years under the Water Quality Program’s watershed approach to water quality management.

Monitoring to validate the TMDL study and measure water quality improvement in the Chehalis River will be ongoing. Adjustments to wasteload allocations and load allocations may be made depending on the results of these studies.

Whole Effluent Toxicity

The Water Quality Standards also require that the effluent not cause toxic effects in the receiving waters. Many toxic pollutants cannot be detected by commonly available detection methods. However, toxicity can be measured directly by exposing living organisms to the wastewater in laboratory tests and measuring the response of the organisms. Toxicity tests measure the aggregate toxicity of the whole effluent and, therefore, this approach is called whole effluent toxicity (WET) testing (reference WAC 173-205). Whole effluent toxicity testing measures both acute toxicity and chronic toxicity.

Acute toxicity tests measure death as the significant response to the toxicity of the effluent. Dischargers who monitor their wastewater with acute toxicity tests are providing an indication of the potential lethal effect of the effluent to organisms in the receiving environment. Previous characterization was tested using older, outdated protocols with the rainbow trout method.

Chronic toxicity tests measure various sublethal toxic responses such as retarded growth or reduced reproduction. Chronic toxicity tests often involve either a complete life cycle test of an organism with an extremely short life-cycle or a partial life-cycle test on a critical stage of one of a test organism's life cycles.

WAC 173-205-030(4) states that characterization for WET may be delayed for facilities that are under a compliance schedule to implement technology-based controls or to achieve compliance with water quality-based effluent limits. The Permittees are required to complete an evaluation of discharge alternatives to

meet the TMDL/WLA recommendations and design and construct that alternative by the schedule given in Section S.F of the permit.

Because of the sampling protocols used in the previous characterization and the requirement to remove the discharge from the river due to the problem with dissolved oxygen, it would be difficult at this time to assess problems in the receiving waters that may be the result of toxicity in the effluent. The permit contains requirements for additional priority pollutant scans and monitoring for pollutants of concern, also, the City of Chehalis is required to develop a pretreatment ordinance with local limits. Therefore, the Department has determined that doing further WET characterization for determining acute and chronic WET limits should be delayed.

The Permittee will be making treatment process and material changes at the facility. Therefore, the Department will require effluent characterization in the next permit renewal. The Permittee may demonstrate to the Department the effluent toxicity or non-toxicity by performing toxicity testing at the time the treatment process and material changes are made. This demonstration may include the use of acute and chronic rapid screening tests as per WAC 173-205-120. These tests may be completed during the last summer of the permit period or construction schedule.

Human Health

The conditions in this permit seek to protect aquatic life from toxic effects as required by the U.S. EPA in its National Toxic Rule (Fed. Reg., V.57, No. 246). It is assumed that protecting aquatic life will also protect the health of humans. If the Department finds that this permit does not protect human health, the permit will be modified to incorporate new conditions as needed.

The WWTP effluent priority pollutant scan (dated December 27, 1993) indicates the possible presence of a chemical with human health-based criteria, Aldrin. Aldrin is listed as a carcinogen and has the water and organism criterion = 0.00013 ug/L and water only criterion = 0.00014 ug/L. Since there were no follow-up testing for this pollutant or others, the permit will require additional priority pollutant scans to determine the reasonable potential for exceedance of the human health criteria. The harmonic mean flow in the Chehalis River is 454 cfs and the dilution ratio is 42; therefore, it is important to determine the pollutants of concern. The WWTP and outfall location will have to be modified; therefore, implementation of any human health limits will be applied to the modified facility, as applicable.

Two priority pollutant scans shall be conducted during years one and two of the permit, one during the wet season (November through April) and one during the dry season (May through October). These data shall be submitted with the appropriate DMRs. If the monitoring results show that the human health limits for any pollutants are being exceeded, the Permittee shall submit a schedule of compliance to the Department that includes source control requirements (i.e., evaluate sources of pollutants, examine ways to control sources, and implement methods of control).

Sediment Quality

The Department has promulgated aquatic sediment standards (Chapter 173-204 WAC) to protect aquatic biota and human health. These standards state that the Department may require Permittees to evaluate the potential for the discharge to cause a violation of applicable standards (WAC 173-204-400). The final determination of the selected alternative that includes a discharge into the upper end of the Centralia Reach may require monitoring of sediment oxygen demand (SOD) downstream of the discharge.

Ground Water Quality

The Department has promulgated Ground Water Quality Standards (Chapter 173-200 WAC) to protect uses of ground water. Permits issued by the Department shall be conditioned in such a manner so as not to allow violations of those standards (WAC 173-200-100).

This discharger has no discharge to ground and, therefore, no limitations are required based on potential effects to ground water.

MONITORING AND REPORTING

Effluent monitoring, recording, and reporting are required (WAC 173-220-210) to verify that the treatment process is functioning correctly and the effluent limitations are being achieved.

Monitoring of sludge quantity and quality is necessary to determine whether or not a discharger will be considered a sludge generator and to determine the appropriate uses of the sludge. Sludge monitoring is required in accordance with 40 CFR 122.44(i)(2).

The monitoring and testing schedule is detailed in the permit under Condition S.2. Specified monitoring frequencies take into account the quantity and variability of discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring. The required monitoring frequency is consistent with agency guidance given in the current version of the Department Permit Writer's Manual for (insert type of treatment facility). This frequency of monitoring is considered to be the minimum frequency to document compliance.

OTHER PERMIT CONDITIONS

PREVENTION OF FACILITY OVERLOADING

Overloading of the treatment plant may result in a violation of the terms and conditions of the permit. To prevent this from occurring, Chapter 90.48.110 RCW and WAC 173-220-150 require the Permittee to take the actions detailed in permit requirement S.4. to plan expansions or modifications before existing capacity is reached and to report and correct conditions that could result in new or increased discharges of pollutants. Condition S.4. restricts the amount of flow.

OPERATION AND MAINTENANCE (O & M)

The proposed permit contains condition S.5. as authorized under RCW 90.48.110, WAC 173-220-150, Chapter 173-230 WAC, and WAC 173-240-080. It is included to ensure proper operation and regular maintenance of equipment and to ensure that adequate safeguards are taken so that constructed facilities are used to their optimum potential in terms of pollutant capture and treatment.

RESIDUAL SOLIDS HANDLING

To prevent water quality problems occurring from the improper storage, handling, or disposal of solid wastes, the Permittee is required in permit condition S.7. to handle and dispose of all residual solids in accordance with the requirements of RCW 90.48.080 and the jurisdictional health department; the Department-required management plan (WAC 173-240-060(3)(m)); State Water Quality Standards; and applicable federal laws.

SEWAGE SLUDGE AND BIOSOLIDS USE OR DISPOSAL PRACTICES

There are federal, state, and local jurisdictional health department requirements for use or disposal of sewage sludge and biosolids. The federal regulations published at 40 CFR part 503 establish technical standards for land application, surface disposal, and incineration. Final use or disposal of biosolids or sewage sludge requires a permit. The Permittee should consult with the Department and the jurisdictional health department regarding biosolids and sewage sludge permit requirements. The Permittee, however, shall comply with the monitoring requirements in this permit for sludge processed at the plant prior to disposal.

PRETREATMENT

Industrial Users

In our efforts to ensure the high quality of the waters of the state, we have evaluated the capacity of the City's Publicly Owned Treatment Works (POTW) to accept certain heavy metals from Significant Industrial Users (SIUs). Our evaluation, based upon the current outfall location, showed that the City has limited capacity to accept discharges of various heavy metals from SIUs and limits are needed on a total of 11 metals.

The Department is designated by RCW 90.48.260 as the state water pollution control agency for all purposes of the Federal Water Pollution Control Act (FWPCA). This provision grants the Department complete authority to establish any national waste discharge or pollution discharge elimination permit system including pretreatment requirements and the enforcement of the program through penalties, emergency powers, and criminal sanctions. Full authority and responsibility to implement the federal pretreatment program was delegated from the Environmental Protection Agency (EPA) to the Department in May 1986.

Federal Regulation 40 CFR section 403.8(a) requires a POTW or combinations of POTW's operated by the same authority with SIUs and a total design flows over five (5) million gallons a day to develop a pretreatment program. The City of Chehalis meets this criteria, however, the Department has exercised the option to assume this permitting responsibility for the City. The Department does this to avoid requiring cities with few industries to develop, administer, and maintain the complex pretreatment program.

Although the Department assumes responsibility for permitting SIUs, some elements of a pretreatment program still require actions on the part of each local jurisdiction. These actions include adoption of technically based local limits and the performance of industrial user surveys.

Federal Regulation 40 CFR 403.5(c) specifies when specific limits must be developed by a POTW. This section requires that all POTWs, where pollutants have resulted in interference or pass through, develop and enforce specific effluent limits for industrial user(s), and all other users. These limits together with appropriate changes in the POTW treatment plant's facilities or operation must ensure renewed and continued compliance with the POTW's NPDES permit.

The City of Chehalis is required to adopt an ordinance which limits discharges of copper, lead, mercury, nickel, silver, and six other heavy metals. These conditions are based upon the Department's assessment of the ability of the POTW to accept these metals while complying with water quality standards. This requirement to codify local limits protective of the POTW is part of the pretreatment program which the Department is required to enforce.

While we have provided this evaluation at no cost to the City, the City may choose to have a

wastewater consultant independently confirm our analysis at the City's expense without being bound by any such analysis. If the conclusion of such analysis is that less stringent limits are adequately protective, the analysis must be approved by the Department before less stringent limits are codified.

In either case, the order requires the local limits to be codified by December 1, 1995.

To provide more direct and effective control of pollutants discharged to the sanitary sewer, the Permittee is required to develop a Pretreatment Ordinance to limit the amount of pollutant loadings discharged to the City's sewer system. The ordinance will include the pollutants copper, silver, and zinc. Arsenic, cadmium, chromium, copper, cyanide, lead, molybdenum, nickel, selenium, silver, and zinc.

An update to the Permittee's industrial user survey is required prior to expiration of this permit to determine the extent of compliance of all industrial users of the sanitary sewer and wastewater treatment facility with federal pretreatment regulations (40 CFR 403 and Sections 307(b) and 308 of the Clean Water Act), with state regulations (Chapter 90.48 RCW and Chapter 173-216 WAC), and with local ordinances.

Local Limit Reevaluation

As sufficient data becomes available, the Permittee shall, in consultation with the Department, reevaluate its local limits in order to prevent pass through or interference. Upon determination by the Department that any pollutant present causes pass through or interference, or exceeds established sludge standards, the Permittee shall establish new local limits or revise existing local limits as required by 40 CFR 403.5. In addition, the Department may require revision or establishment of local limits for any pollutant that causes an exceedance of the Water Quality Standards or established effluent limits, or that causes whole effluent toxicity. The determination by the Department shall be in the form of an Administrative Order. In order to develop these local limits, the Department will provide environmental criteria or limits for the various pollutants of concern.

The Department may modify this permit to incorporate additional requirements relating to the establishment and enforcement of local limits for pollutants of concern. Any permit modification is subject to formal due process procedures pursuant to state and federal law and regulation.

EXISTING OUTFALL REPLACEMENT EVALUATION

Permit condition S.11. of the previous permit required the Permittee to conduct an outfall inspection and submit a report detailing the findings of that inspection. The purpose of the inspection was to determine the condition of the discharge pipe and diffusers and to determine if sediment is accumulating in the vicinity of the outfall. The inspection report shows that the outfall needs to be replaced. As part of the study to determine compliance with this permit and the WLA, the Permittee shall complete an engineering evaluation for replacement of the outfall. The evaluation shall be submitted to the Department within one year of the final selection of the discharge alternative (see section S.G. of permit)

GENERAL CONDITIONS

General Conditions are based directly on state and federal law and regulations and have been standardized for all NPDES permits issued by the Department.

PERMIT MODIFICATIONS

The Department may modify this permit to impose numerical limitations, if necessary to meet Water Quality Standards, Sediment Quality Standards, or Ground Water Standards, based on new information obtained from sources such as inspections and effluent monitoring.

The Department may also modify this permit as a result of new or amended state or federal regulations.

RECOMMENDATION FOR PERMIT ISSUANCE

This permit meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to protect human health, aquatic life, and the beneficial uses of waters of the state of Washington. The Department proposes that this permit be issued for five years.

CITY OF NAPAVINE AND LEWIS COUNTY SEWER DISTRICT NUMBER 1

The permit names the City of Napavine and Lewis County Sewer District No. 1 as co-permittees within the City of Chehalis. The permit requires the co-permittees to comply with permit requirements, including information on overflows and bypasses, identification of industrial/commercial users, notification of new or altered sources, infiltration and inflow, and all general conditions of the permit.

REFERENCES FOR TEXT AND APPENDICES

Pickett, Paul J., Dept. of Ecology,
"Upper Chehalis River Total Daily Load Study," Publication No. 94-126, July 1994.
Memos to Jerry Anderson, SWRO Water Quality Section, "Revised Alternative #1 Loading," May 15, 1995; and "Design Flows for Chehalis River Discharges to the Centralia Reach," undated. Memo to Kahle Jennings, "Modeling of Chehalis TMDL Wasteload Allocation Alternatives in Response to Letter from City of Chehalis dated August 23, 1995," October 20, 1995.

City of Chehalis, letter from Barry Heid to Darrel Anderson, Ecology, regarding Chehalis Draft NPDES Permit, dated August 23, 1995).

Memorandum (Internal), WQP-SWRO to WQFAP, "City of Chehalis Infiltration and Inflow Removal Program," August 10, 1994.

Das, Tapas, Dept. of Ecology, "Chehalis River Basin Class II Inspections At Eight NPDES Permitted Dischargers August 1991 - August 1992," December 1993.

Letter to City of Chehalis, Re: Effluent Mixing Study and Outfall Evaluation, June 17, 1993.

CH2M HILL Consultants, "Effluent Mixing Study and Outfall Evaluation" City of Chehalis NPDES Permit No. WA-002110-5, January 1993.

Environmental Protection Agency (EPA)

1991. Technical Support Document for Water Quality-based Toxics Control. EPA/505/2-90-001.

1988. Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling. USEPA Office of Water, Washington, D.C.

1985. Water Quality Assessment: A Screening Procedure for Toxic and Conventional Pollutants in Surface and Ground Water. EPA/600/6-85/002a.

Wright, R.M., and A.J. McDonnell.

1979. In-stream Deoxygenation Rate Prediction. Journal Environmental Engineering Division, ASCE. 105(E2). (Cited in EPA 1985 op.cit.).

Tsivoglou, E.C., and J.R. Wallace.

1972. Characterization of Stream Reaeration Capacity. EPA-R3-72-012. (Cited in EPA 1985 op.cit.).

REVIEW BY THE PERMITTEES

A proposed permit was reviewed by the Permittee for verification of facts. Only factual items were corrected in the draft permit.

APPENDIX A--PUBLIC INVOLVEMENT INFORMATION

The Department has tentatively determined to reissue a permit to the applicant listed on page one. The permit contains conditions and effluent limitations which are described in the preceding pages of this fact sheet.

Public notice of application was published on (date) and (date) in (name of publication) to inform the public that an application had been submitted and to invite comment on the reissuance of this permit.

The Department will publish a Public Notice of Draft (PNOD) on (date), in (name of publication) to inform the public that the draft permit and fact sheet are available for review. Interested persons are invited to submit written comments regarding the draft permit. The draft permit, fact sheet, and related documents are available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. weekdays, by appointment, at the regional office listed below. Written comments should be mailed to:

Water Quality Permit Coordinator
Department of Ecology
Southwest Regional Office
P.O. Box 47775
Olympia, Washington 98504-7775

Any interested party may comment on the draft permit or request a public hearing on this draft permit within the thirty (30) day comment period to the address above. The request for a hearing shall indicate the interest of the party and the reasons why the hearing is warranted. The Department will hold a hearing if it determines there is a significant public interest in the draft permit (WAC 173-220-090). Public notice regarding any hearing will be circulated at least thirty (30) days in advance of the hearing. People expressing an interest in this permit will be mailed an individual notice of hearing (WAC 173-220-100).

The Department will consider all comments received within thirty (30) days from the date of public notice of draft permit, in formulating a final determination to issue, revise, or deny the permit. The Department's response to all significant comments is available upon request and will be mailed directly to people expressing an interest in this permit.

Further information may be obtained from the Department by telephone, (360) 407-6279, or by writing to the address listed above.

APPENDIX B--DEFINITIONS

Acute Toxicity--The lethal effect of a compound on an organism that occurs in a short period of time, usually 48 to 96 hours.

Ambient Water Quality--The existing environmental condition of the water in a receiving water body.

Ammonia--Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. Reference "The Handbook of Chlorination", Third Edition, by George Clifford White, Nitrification Summary, page 602 to page 606.

BOD₅--Determining the Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD₅ is used in modeling to measure the reduction of dissolved oxygen in a receiving water after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

Chlorine--Chlorine is used to disinfect wastewaters of pathogens harmful to human health. It is also extremely toxic to aquatic life.

Chronic Toxicity--The effect of a compound on an organism over a relatively long time, often 1/10 of an organism's lifespan or more. Chronic toxicity can measure survival, reproduction or growth rates, or other parameters to measure the toxic effects of a compound or combination of compounds.

Class 1 Inspection--A walk-through inspection of a facility that includes a visual inspection and some examination of facility records. It may also include a review of the facility's record of environmental compliance.

Class 2 Inspection--A walk-through inspection of a facility that includes the elements of a Class 1 Inspection plus sampling and testing of wastewaters. It may also include a review of the facility's record of environmental compliance.

Critical Condition--The time during which the combination of receiving water and waste discharge conditions have the highest potential for causing toxicity in the receiving water environment. This situation usually occurs when the flow within a water body is low, thus, its ability to dilute effluent is reduced.

Fecal Coliform Bacteria--Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated wastewater and/or the presence of animal feces.

Mixing Zone--An area that surrounds an effluent discharge within which water quality criteria may be exceeded. The area of the authorized mixing zone is specified in a facility's permit and follows procedures outlined in state regulations (Chapter 173-201A WAC).

National Pollutant Discharge Elimination System (NPDES)--The NPDES (Section 402 of the Clean Water Act) is the federal wastewater permitting system for discharges to navigable waters of the United States. Many states, including the state of Washington, have been delegated the authority to issue these permits. NPDES permits issued by Washington state permit writers are joint NPDES/State permits issued under both state and federal laws.

pH--The pH of a liquid measures its acidity or alkalinity. A pH of 7 is defined as neutral, and large variations above or below this value are considered harmful to most aquatic life.

Technology-based Effluent Limit--A permit limit that is based on the ability of a treatment method to reduce the pollutant.

Total Maximum Daily Load (TMDL)--A TMDL includes a determination of the amount of a pollutant, or property of a pollutant, from point, nonpoint, and natural background sources, including a margin of safety, that may be discharged to a water quality-limited waterbody. Any loading above this loading capacity risks violating water quality standards. TMDLs are required by the Federal Clean Water Act (CWA), under Section 033(d).

Total Suspended Solids (TSS)--Total suspended solids is the particulate material in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

Water Quality-based Effluent Limit--A limit on the concentration of an effluent parameter that is intended to prevent the concentration of that parameter from exceeding its water quality criterion after it is discharged into a receiving water.

APPENDIX C--TECHNICAL CALCULATIONS

DETERMINATION OF REASONABLE POTENTIAL

The following variables were used for each pollutant to determine the reasonable potential for violations:

- Variable A. *COEFFICIENT OF VARIATION*--This is a measure of variability of a pollutant in the effluent and is calculated as the standard deviation divided by the mean. When less than ten data points are available a value of 0.6 is used (EPA 1991). This value is representative of the variability of the conventional pollutants from municipal treatment plants and therefore is used to estimate the variability of other pollutants.
- Variable B. *NUMBER OF DATA POINTS* on the concentration of the pollutant in the effluent from which the determination is being made.
- Variable C. *HIGHEST VALUE OF THE DATA POINTS* used to determine Variable B.
- Variable D. *MAXIMUM EXPECTED CONCENTRATION OF THE POLLUTANT IN THE EFFLUENT.*
- Variable E. *MIXING ZONE DILUTION FACTOR* (for either the chronic or acute zone, depending on the calculation).
- Variable F. *CONCENTRATION OF THE POLLUTANT AT THE EDGE OF THE MIXING ZONE.*
- Variable G. *THE WATER QUALITY CRITERION VALUE FOR THE POLLUTANT.*

Variables A, B, and C are used with Table 3-2 of EPA, 1991 to estimate the maximum expected concentration of the toxic pollutant (95th percentile) in the effluent at a 99 percent confidence level (Variable D). These are shown in the following table.

POLLUTANT	A	B	C	D
Chlorine ¹	0.6	60	0.72	0.72
Ammonia ²	0.6	49	41.9	41.9
Copper	0.3	7	22	25.7
Silver	0.7	7	19	31.7
Zinc	0.28	7	61	70.2

¹ Total residual

² Total Ammonia (mg/L NH₃-N)

The maximum expected concentration (Variable D) is added to the background level of the pollutant in the receiving water. This sum is then divided by the dilution factor (Variable E) at the critical condition to determine the concentration of the pollutant at the edge of the mixing zone (Variable F), as shown in the following formula:

$$(D + (\text{background concentration} \times (E - 1))) \div E = F$$

If the resultant concentration at the edge of the mixing zone (Variable F) exceeds the water quality criterion (Variable G), an effluent limit is imposed. These factors are shown in the following table.

POLLUTANT	D	E	F	G
Ammonia ^a	41.9	1.20	34.9	11.5
Ammonia ^c	41.9	5.17	8.2	0.94
Copper ^a	30.8	1.20	25.7	7.952
Copper ^c	30.8	5.17	5.96	5.637
Silver ^a	41.8	1.2	31.7	0.654
Silver ^c	41.8	5.17	n/a	***
Zinc ^a	84.2	1.20	70.2	57.954
Zinc ^c	84.2	5.17	16.3	52.491

^a denotes calculations using the acute criterion and the acute zone dilution factor

^c denotes calculations using the chronic criterion and the chronic zone dilution factor

CALCULATION OF WATER QUALITY-BASED EFFLUENT LIMITS

Water Quality-based effluent limits were calculated using the following method from EPA, 1991.

Maximum Daily Limit = MDL

$$MDL = LTAx e^{(Z\sigma - 0.5\sigma^2)}$$

where:

$$\sigma^2 = \ln[CV^2 + 1]$$

$$z = 2.326 \text{ (99th percentile occurrence}$$

probability)

LTA = Long term average

Average Monthly Limit = AML

$$AML = LTAx e^{(Z\sigma_n - 0.5\sigma_n^2)}$$

where:

$$\sigma^2 = \ln[(CV^2 \div n) + 1]$$

n = number of samples/month

z = 1.645 (95th percentile occurrence probability)

LTA = LTA_a or LTA_c, whichever is smaller

$$LTA_a = WLA_a \times e^{[0.5\sigma^2 - z\sigma]}$$

where:

$$\sigma^2 = \ln[CV^2 + 1]$$

$$z = 2.326$$

WLA_a = ACUTE WASTELOAD ALLOCATION = (acute criteria) x (acute zone dilution factor)

$$LTA_c = WLA_c \times e^{[0.5\sigma^2 - z\sigma]}$$

where:

$$\sigma^2 = \ln[(CV^2 \div 4) + 1]$$

$$z = 1.645$$

WLA_c = CHRONIC WASTELOAD ALLOCATION = (chronic criteria) x (chronic zone dilution factor)

APPENDIX D - CHEHALIS TOTAL MAXIMUM DAILY
LOAD (TMDL) MEDIATION AGREEMENT

The attached Chehalis TMDL Mediation Agreement and Consent Decree between the City of Chehalis, the City of Centralia, and Darigold, Inc. ("The dischargers") and the Washington State Department of Ecology ("Ecology") is the basis for the changes in permit Special Conditions S1.A., S1.B., S1.C., S1.D., S1.E., S1.F., and S2. . The following minor additions to the permit are based on the changes required by the Consent Decree and as reflected in the monthly Discharge Monitoring Reports (DMRs):

Additions to Permit Special Conditions

Unless a facility qualifies for an alternative discharge standard or effluent limitations, listed in WAC 173-221-050, its discharge must meet the standards in WAC 173-221-040. The effluent must meet the lower number obtained by either of the next two methods:

1. Multiply 20 mg/L (or 30 mg/L) by 8.34 and by the design flow as expressed in millions gallons per day (MGD) for the maximum flow month in the design year. The result is in lbs/day.
2. Multiply the Ecology approved, design maximum month influent loading (lbs/day) by 0.15.

S1.B. Final Effluent Limitations During Dry Weather

The monthly average effluent BOD₅ and TSS loading discharged is based on the agreed upon effluent concentration (20 mg/L) and the maximum average dry monthly discharge flow (1.80 MGD). The flow was recorded in the DMRs in the May through October period for the years 1990 through 1996.

$$\begin{aligned}(20 \text{ mg/L}) \times (8.34) \times (1.8 \text{ MGD}) &= \underline{300 \text{ lbs/day}} \\ (0.15) \times (4880 \text{ lbs/day}) &= 732 \text{ lbs/day (BOD}_5\text{)} \\ (0.15) \times (5125 \text{ lbs/day}) &= 769 \text{ lbs/day (TSS)}\end{aligned}$$

S1.C. Final Effluent Limitations During Wet Weather

The monthly average effluent BOD₅ loading discharged is based on the required percent removal (85%) of the influent loading values (4880 lbs/day).

$$\begin{aligned}(30 \text{ mg/L}) \times 8.34 \times (4.0 \text{ MGD}) &= 1000 \text{ lbs/day} \\ (0.15) \times (4880 \text{ lbs/day}) &= \underline{732 \text{ lbs/day}}\end{aligned}$$

The monthly average effluent TSS loading discharged is based on the required percent removal (85%) of the influent loading values (5125 lbs/day).

$$\begin{aligned}(30 \text{ mg/L}) \times 8.34 \times (4.0 \text{ MGD, design maximum month flow}) &= 1000 \text{ lbs/day} \\ (0.15) \times (5125 \text{ lbs/day}) &= \underline{769 \text{ lbs/day}}\end{aligned}$$

The 85 percent removal requirement will be necessary for the final effluent limitations during wet weather until such time that Ecology approves the Permittee's submittal for alternative limits in accordance with WAC 173-221-050. As per the Chehalis TMDL Agreement and the Consent Decree, the Permittee is authorized to submit the supporting

documentation to Ecology to verify that the “excessive I/T” (Inflow and Infiltration) has been removed from the collection system (EPA definition for “excessive I/T” in accordance with 40 CFR 133.103(d)).